

ABSTRACT OF THE DISCLOSURE

Various components of the present invention are collectively designated as Adaptive Real-Time Embodiments for Multivariate Investigation of Signals (ARTEMIS). It is a method, processes, and apparatus for measurement and analysis of variables of different type and origin. In this invention, different features of a variable can be quantified either locally as individual events, or on an arbitrary spatio-temporal scale as scalar fields in properly chosen threshold space. The method proposed herein overcomes limitations of the prior art by directly processing the data in real-time in the analog domain, identifying the events of interest so that continuous digitization and digital processing is not required, performing direct, noise-resistant measurements of salient signal characteristics, and outputting a signal proportional to these characteristics that can be digitized without the need for highspeed front-end sampling.

The application areas of ARTEMIS are numerous, e.g., it can be used for adaptive content-sentient real-time signal conditioning, processing, analysis, quantification, comparison, and control, and for detection, quantification, and prediction of changes in signals, and can be deployed in automatic and autonomous measurement, information, and control systems. ARTEMIS can be implemented through various physical means in continuous action machines as well as through digital means or computer calculations. Particular embodiments of the invention include various analog as well as digital devices, computer programs, and simulation tools.